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USPT	14 and (transaction\$1 or database)	1	<u>L6</u>
USPT	14 and (transaction\$1 and database)	0	<u>L5</u>
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USPT	5630127.pn. or 5559313.pn. or 5682482.pn. or 5604899.pn. or 5636117.pn.	5	<u>L1</u>

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<u>DB Name</u>	<u>Query</u>	<u>Hit Count</u>	<u>Set Name</u>
USPT,PGPB,JPAB,EPAB,DWPI,TDBD	transaction\$1 with (pricing\$ or charg\$ or cost\$) and database and record\$1 and bills	0	<u>L2</u>
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L6: Entry 1 of 1

File: USPT

Sep 24, 1996

DOCUMENT-IDENTIFIER: US 5559313 A

TITLE: Categorization of purchased items for each transaction by a smart card**ABPL:**

A smart card that is responsive to a list of items with individual prices that are received from a point of sale (POS) terminal during an individual transaction to automatically insert these items into expense categories. A personal computer later retrieves these categories and associated information and inserts the information into a spreadsheet. The microprocessor in the smart card relies on stored tables defining commonly used item designations and a table that defines definitions based on an ongoing learning process by the microprocessor in conjunction with the personal computer.

BSPR:

This invention relates to the collection of financial information, more particularly, it relates to the categorization of individual items for each transaction by a smart card.

BSPR:

One of the problems experienced by individuals in trying to keep accurate records is the problem of capturing and storing data into a computer spreadsheet program or some other type of computer program. This problem is increased by the retail stores that sell a wide variety of goods under one roof. For example, large stores may sell groceries, pharmaceuticals, clothing, sporting equipment, furniture, etc. The result is that even when an individual has retained the credit card receipt or entered the total amount in a check book register at such a store, a single purchase may include a number of categories for an individual's budget. At present, the only way of handling this problem is to retain the sales receipt and mutually enter each item on the sales receipt into the proper category of a spreadsheet program. This is a laborious and error prone method. The end result is that the vast majority of people do not maintain accurate personal or business records for their transactions that involve cash, check, debit cards, or credit cards. The reason is simply that a single trip to a large store will result in the purchase of items that may fall into five or more different categories of a budget.

BSPR:

The foregoing problems are solved and a technical advance is achieved by a smart card that is responsive to a list of items with individual prices that are received from a point of sale (POS) terminal during an individual transaction to automatically insert these items into expense categories. A personal computer later retrieves these categories and associated information and inserts the information into a spreadsheet. Advantageously, the microprocessor in the smart card relies on stored tables defining commonly used item designations and a table that defines definitions based on an ongoing learning process by the microprocessor in conjunction with the personal computer.

DRPR:

FIG. 2 illustrates the arrangement of a transaction center, POS terminal, and a smart card reader;

DEPR:

Smart card 100 is pictorially illustrated in FIG. 1 and illustrated in block diagram form in FIG. 4. During a transaction with a POS terminal such as POS 202 of FIG. 2, smart card 100 receives the itemized list of purchases as digital information from POS terminal 202 via smart card reader 203. In addition, smart card 100 receives the name of the store, total amount, and type of transaction. The transaction type may be cash, check, debit card, or credit card. Smart card 100 is responsive to this itemized list to access the item code, access the type of business code, and determine the category into which each listed item is to be assigned. Each assigned category has its total incremented by the amount of each item assigned to it. In addition, the total amount of the transaction, date, transaction type and business name is stored for later correlation with a bill from the institution handling that particular transaction type. Periodically, the user of card 100 utilizes personal computer 340 of FIG. 3 to read the total amounts for each category, and the transaction information. In addition, the user of smart card 100 utilizes personal computer 340 to update information in smart card 100 utilized to determine categories.

DEPR:

FIG. 4 illustrates, in block diagram form, smart card 100 of FIG. 1. The smart card receives power via power interface 112 which is shown in greater detail in FIG. 4 as comprising power transducer 402 and battery charger 403 and as set forth in U.S. Pat. No. 4,802,080 which is hereby incorporated by reference. Smart card 100 communicates signals with outside devices via signal interface 111 using a capacitively coupled mechanism as is set forth in U.S. Pat. No. 4,795,898 which is also hereby incorporated by reference. Computer 113 provides overall control for smart card 100. Power for smart card 100 is provided by battery 115 which is charged by an external device via interface 112. The latter interface includes power transducer 202 and battery charger 203. Computer 113 maintains all tables and lists in memory 114. In addition, computer 113 maintains in memory 114 credit and debit card numbers that are transmitted upon request to a POS terminal to allow card transactions.

DEPR:

FIGS. 5-7 illustrate the tables that are utilized by computer 113 of smart card 100 to determine categories. There are a plurality of classification tables 501-502. These tables contain the alphanumeric descriptions utilized for a particular industry. Associated with each item is a code number. Each code number designates a particular product or service and is utilized to identify the same product or service in the different classification tables. Business table 504 lists the name of the business and the business type. On FIG. 5, only basic and entertainment types are illustrated; however, one skilled in the art could readily come up with a plurality of business types. Correlation table 531 is utilized to determine the category number in response to a code number and a business type. Category table 503 maintains the total amount of money spent for each particular category. Transaction tables 606, 607, and 608 of FIG. 6 maintain the date, amount, and transaction type of an individual transaction by business. Exception tables 601, 602, and 603 maintain the item name and price for any item that could not be found in the classification tables. Each exception table is associated with a business. Using a personal computer, the user reads smart card 100 and can determine the code numbers for items in the exception tables. For an item that will not be purchased for some long period of time, the user can choose not to assign a code number to that item.

DEPR:

The following two examples of transactions are given to illustrate how the tables of FIGS. 5 and 6 are utilized. In the first example, the user of smart card 100 has purchased the following items from Safeway: potato masher at \$2.04, coffee at \$4.79, a bakery item at \$0.70, and a six pack of beer at \$4.99. Computer 113 first searches business table 504 to find the entry for the Safeway that is located at 92nd Street. After determining that line 518 of business table 504 has the entry for Safeway, computer 113 accesses the table number field of line 518 and determines that

classification table 501 is to be initially searched. Computer 113 then searches classification table 501 looking for the item named "coffee". This item appears in line 511 and has a code number of "1". Computer 113 then returns to line 518 of business table 504. Line 518 designates that the business type is "B". Computer 113 accesses correlation table 531. It utilizes the business type of "B" in row 533 and the code number of "1" in column 532. The column and row designate that entry 541 in category number column 534 is the correct category number which is "1". Using the category number, computer 113 accesses category table 503 and adds the price of the coffee into the total amount of line 521. (Note, that the amount of \$16.27 illustrated in line 521 will only be correct after both examples have been described.)

DEPR:

Consider now the second example of the user of card 100 visiting two types of restaurants. The user has determined that meals purchased at Burger King are not entertainment but rather are basic living costs. On the other hand, the user has determined that meals purchased at the Briarwood Restaurant constitute entertainment. Smart card 100 is responsive to a transaction for food purchased at a Burger King to perform the following operations. First, computer 113 determines that classification table 501 is utilized for Burger King Restaurants by accessing line 526 of business table 504. Computer 113 searches classification table 501 for a match on the word "food". This match is found in line 514 which has a code number of "1200". Computer 113 accesses line 526 of business table 504 and determines that the business type for Burger King is "B". (Business table 504 allows for the fact that the user may visit Burger Kings at a number of different locations.) Computer 113 then accesses correlation table 532 with code number "1200" and business type "B". A match is found in entry 544 of category number column 534. Computer 113 then is responsive to the category number to access category table 503 and add the amount of the meal at Burger King, \$10.68, into the total amount field of line 521.

DEPR:

In response to transaction information received at the Briarwood Restaurant, computer 113 accesses business table 504 and finds a match for the Briarwood Restaurant on line 519 and determines from the table number entry of line 519 that classification table 501 is to be used. The transaction information includes beer and food and classification table 501 for beer has a code number of "3". From line 519, computer 113 determines that the business type is "E". Upon accessing correlation table 531, computer 113 finds a match for the code number and the business type in entry 546 of category number column 536. Computer 113 is responsive to the category number "30" found in entry 546 to access category table 503 and add the price of the beer into the total amount field of line 528. The price of the food at the Briarwood Restaurant is handled in a similar manner with the exception that entry 547 of category number column 536 is utilized.

DEPR:

Consider the utilization of transaction tables 606, 607, and 608. When the transaction at Safeway takes place, computer 113 accesses line 518 of business table 504. Computer 113 utilizes the information in the pointer field of line 518 to locate transaction table 606 in memory 114. Computer 113 then inserts into line 623 the date, mount, and transaction type, e.g. credit card. The transaction type is transmitted to computer 113 by the POS terminal. Line 624 of transaction table 607 and line 627 of transaction 608 are similarly processed for the transactions at Briarwood and Burger King, respectively.

DEPR:

FIG. 8 illustrates in flow chart form, the operations performed by POS terminal 202 with respect to smart card 100. First, decision block 801 determines whether a smart card has been inserted into POS terminal 202. If the answer is no, control is transferred to 806 for normal processing. If the answer is yes, control is transferred to decision block 802. The latter decision block determines if POS terminal 202 is performing a credit card type transaction. If the answer is no, POS terminal 202 determines if it a

cash or check transaction. If the answer is no, control is transferred to block 808 for error recovery. If the answer is yes, control is transferred to block 809. Returning to decision block 802, if the answer is yes, control is transferred to block 803, which requests the credit card number from smart card 100. Decision block 804 determines if the credit card number is valid by POS terminal 202 transmitting messages to transaction center 201. If it is not a valid credit card, control is transferred to block 817 for error recovery. If it is a valid credit card, control is transferred to 809 which does the normal transaction processing such as printing a bill and updating internal values within POS terminal 202 and transaction center 201. After execution of block 809, block 811 transmits a transaction message to smart card 100 including the date, payee, and amount of the transaction. Decision block 812 is executed to await the arrival of a message. When a message arrives, decision block 812 transfers control to block 816 if the message is a terminate message. If the answer is no, control is transferred to decision block 813 which tests if the received message is an error message. If the answer is no, control is transferred to block 817 for error recovery. If the answer is yes in decision block 813, control is transferred to block 814 which displays an error from smart card message on POS terminal 202. After execution of block 814, control is transferred to block 816.

DEPR:

FIGS. 9, 10, and 11 illustrate the operations performed by computer 113 using the tables illustrated in FIGS. 5, 6, 7, and 12. Decision block 901 determines whether data is being received from the POS terminal. If the answer is yes, control is transferred to decision block 902 which determines if a request is being made for a credit card number. If the answer is yes, block 904 transmits the credit card number to the POS terminal and transfers control to decision block 907. If the answer in decision block 902 is no, control is transferred to decision block 903 which determines if a debit card number is being requested. If the answer is yes, decision block 906 transmits the debit card number to the POS terminal and transfers control to decision block 907. If the answer in decision block 903 is no, control is transferred to decision block 907. If the POS terminal is not transmitting transaction information, control is transferred to block 908 which transmits an error message to the POS terminal. If transaction information is being received, block 909 stores the item names and costs in the item table and transfers control to decision block 911. The latter block determines if the business name received in the transaction information is found within the business table. If the user had previously made transactions with the business, the business name should be in the business table. If the business name is found in the business table, the pointer field of the line in the business table that is designated by the business name is accessed to determine the location of the transaction table by execution of block 912. Block 913 then stores the date, amount, and transaction type in the transaction table designated by the pointer field. Next, the table number field is accessed to determine the classification table that is to be used first in finding a match for the item name so as to determine the code number. Block 916 accesses the first item name from the item table and transfers control to decision block 917. Decision block 917 searches the classification table to determine a complete or partial match for the item name. If no match is found in the classification table, control is transferred to block 918. The latter block accesses the selection table to obtain the next choice of a table number that defines a new classification table. The selection table is illustrated in FIG. 7 and has a plurality of choices associated with a primary choice which is the number stored in the table number of the designated line of the business table illustrated in FIG. 5. If another choice is available, decision block 919 transfers control back to block 917 to determine if the item name can be found in the new classification table. If the answer in decision block 919 is no, block 921 inserts the item name and cost into the exception table designated by the pointer field of the selected line of business table 504 of FIG. 5. From block 921, control is transferred to decision block 922 which determines if the last item name in the item table has just been processed. If the answer is yes, the transaction has been completed and control is transferred to block 923. If the answer in decision block 922 is no, control is transferred to block 924

which accesses the next item name from the item table and transfers control to block 926. Block 926 sets the table number back to the number found in the table number field of the designated line of business table 504. This is done since the table number in the table number field should designate a classification table which will contain most of the items bought from the business designating the line in business table 504. From block 926, control is transferred back to decision block 917.

DEPR:

Returning to decision block 911 of FIG. 9, if the business name is not found in business table 504 indicating that the user had never been to that business, decision block 911 transfers control to block 1101 of FIG. 11. Block 1101 creates a new line in business table 504, and block 1102 creates new transaction and exception tables to be used with the new business. The creation of the new transaction and exception tables results in the location of these tables being placed in the pointer field of the new line in the business table. In addition, the business name is also inserted into the new line. Block 1104 stores the date, amount, and transaction type in the new transaction table designated by the pointer field.

DEPR:

FIGS. 16 and 17 illustrate, in flow chart form, the operations performed by personal computer 340 of FIG. 3. These operations are performed in conjunction with the tables illustrated in FIG. 15. In FIG. 15, tables 1501-1504 and 1531 include the same information as tables 501-504 and 531, respectively, of FIG. 5 with additional descriptive terms. PC transaction and PC exception tables 1511 contain the same information as transaction table 606 and exception table 601 of FIG. 6. PC transaction and PC exception tables 1512 contain the same information as exception table 603 and transaction table 608 of FIG. 6. PC selection table 1507 and PC learning table 1508 include the same information as included in selection table 701 of FIG. 7 and learning table 1201 of FIG. 12, respectively.

DEPR:

Consider now the operations performed by blocks 1618-1623. Block 1618 inserts the newly formed category number column into PC correlation table 1531. Block 1619 inserts the business type received from the user in block 1609 into PC business table 1504. Block 1621 adds new PC transaction and exception tables for the new business line. Decision block 1622 determines if there anymore businesses that have been added to PC business table 1504. If the answer is yes, block 1623 designates the next added line in PC business table 1504 and returns control to block 1607 for processing the next new business. If the answer is no in decision block 1622, control is transferred to block 1626.

DEPR:

Block 1626 requests all transaction and exception tables from computer 113 and stores these tables in the corresponding PC transaction and exception tables. Decision block 1627 scans the PC exception tables to see if any exception lines are present in the exception tables. If the answer is no, control is transferred to block 1701 of FIG. 17. If an exception line has been stored in one of the exception tables, control is transferred from decision block 1627 to block 1628. Blocks 1628-1639 display each of the exception lines to the user and give the user the opportunity to designate the code name and industry for this exception. The industry as illustrated in PC industry table 1506 defines the classification table number. Once the code number and the classification table have been determined, the new code number along with the item is inserted directly into the designated classification table in smart card 100 and into the corresponding PC classification table.

DEPR:

Block 1701 orders the transactions from PC transaction and exception tables by date and then prints out this ordered list of transactions. This ordered list of transactions can then be utilized by the user for various purposes. In addition, it would be possible to create three ordered lists. The first list would be the transactions charged to a credit card number, the second list would be transactions paid for by a check or debit card,

and the third list would be transactions paid for with cash. One skilled in the art can readily determine other ways of printing the transaction information.

DEPR:

Block 1702 allows user written programs to modify the PC category and transactions tables. These user written programs could for example be used to adjust the category and transactions tables for transactions up to the end of the month. These programs could do a variety of other activities utilizing the information provided in the category and transaction tables.

DEPR:

Blocks 1711-1717 give the user the ability to add new item and code numbers into specified classification tables. Block 1711 displays the message "change classification table". Decision block 1712 checks to see if the user desires to change a classification table. If the answer is no, control is transferred to block 1718. If the answer in decision block 1712 is yes, control is transferred to block 1713 which reads the code number, item, and industry name entered by the user. The read information is then used to create a new line in the classification table designated by the industry name. Block 1716 adds a new category number column to PC correlation table 1531 if the code name is new. In addition, block 1716 adds a new code number and code name to PC code table 1509. Decision block 1717 then checks to see if the user wishes to add another item to a classification table. If the answer is yes, control is transferred back to block 1713. If the answer in decision block 1717 is no, control is transferred to block 1718 which updates the category, correlation, transaction, and business tables in smart card 100 with the corresponding PC tables. Block 1719 sets all of the exception tables in smart card 100 to zero contents, and processing is ended by execution of block 1721.

CLPR:

1. A smart card for categorizing items of a transaction, comprising:

CLPR:

2. The smart card of claim 1 further comprises means for adding up all of the item prices received for the transaction and storing this sum in one of a plurality of first table that is designated by the business name.

CLPR:

16. A method for categorizing items of a transaction within a smart card, comprising the steps of:

CLPR:

17. The method of claim 16 further comprises the step of adding up all of the item prices received for the transaction and storing this sum in one of a plurality of first table that is designated by the business name.

CLPV:

means for receiving individual item names, item prices, and a business name for a transaction from a point of sale terminal;

CLPV:

receiving individual item names, item prices, and a business name for a transaction from a point of sale terminal;

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L6: Entry 1 of 1

File: USPT

Sep 24, 1996

US-PAT-NO: 5559313

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TITLE: Categorization of purchased items for each transaction by a smart card

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INVENTOR-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY
Claus; David M.	Indianapolis	IN	N/A	N/A
Murphy; Kevin D.	Indianapolis	IN	N/A	N/A
Thompson; Wanda G.	Indianapolis	IN	N/A	N/A

ASSIGNEE-INFORMATION:

NAME	CITY	STATE	ZIP CODE	COUNTRY	TYPE CODE
Lucent Technologies Inc.	Murray Hill	NJ	N/A	N/A	02

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FIELD-OF-SEARCH: 235/380, 364/401, 364/402, 364/406

PRIOR-ART-DISCLOSED:

U.S. PATENT DOCUMENTS

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PAT-NO	ISSUE-DATE	PATENTEE-NAME	US-CL
<input type="checkbox"/> <u>4295898</u>	January 1989	Bernstein et al.	235/487
<input type="checkbox"/> <u>4798322</u>	January 1989	Bernstein et al.	235/487
<input type="checkbox"/> <u>4802080</u>	January 1989	Bossi et al.	363/75
<input type="checkbox"/> <u>5047614</u>	September 1991	Bianco	235/385
<input type="checkbox"/> <u>5233547</u>	August 1993	Kapp et al.	364/705.02
<input type="checkbox"/> <u>5250789</u>	October 1993	Johnson	235/383
<input type="checkbox"/> <u>5401946</u>	March 1995	Weinblatt	235/383

FOREIGN PATENT DOCUMENTS

FOREIGN-PAT-NO	PUBN-DATE	COUNTRY	US-CL
214653	March 1987	EPX	235/386
1-199292	August 1989	JPX	235/449
2-226394	September 1990	JPX	235/380

ART-UNIT: 254

PRIMARY-EXAMINER: Shepperd; John

ATTY-AGENT-FIRM: Moran; John C.

ABSTRACT:

A smart card that is responsive to a list of items with individual prices that are received from a point of sale (POS) terminal during an individual transaction to automatically insert these items into expense categories. A personal computer later retrieves these categories and associated information and inserts the information into a spreadsheet. The microprocessor in the smart card relies on stored tables defining commonly used item designations and a table that defines definitions based on an ongoing learning process by the microprocessor in conjunction with the personal computer.

30 Claims, 17 Drawing figures